



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/675,518	09/29/2000	Joel A. Drewes	030641.0017.CON1	1569

7590
Michael A Whittaker
Foley & Lardner
402 W. Broadway
23 Floor
San Diego, CA 92101

04/10/2002

EXAMINER

FORMAN, BETTY J

ART UNIT	PAPER NUMBER
----------	--------------

1634

DATE MAILED: 04/10/2002

8

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/675,518

Applicant(s)

DREWES ET AL.

Examiner

BJ Forman

Art Unit

1634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 51-91 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 51-91 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Restriction

1. Applicant's election with traverse of Group I in Paper No. 6 is acknowledged. The traversal is on the grounds(s) that it would not be undue burden to examine the claims of Group I and Group II because the search for Group I, while larger than that required for Group II, would include the search for Group II. The argument has been considered but is not found persuasive because it is maintained that undue burden would be required to examine the claims of Group II along with claims of group I as evidenced by the fact that the claims of Groups I and II have acquired a separate status in the art as recognized by their different classifications as recognized by their divergent subject matter and because a search of the subject matter of invention I is not co-extensive with a search of invention II. Specifically, the claims of Group I are classified under 422/68.1 and the search for the claims Group I requires extensive search of solid supports, compositions of solid supports, construction of solid supports, and the physical properties of solid supports. Conversely, the claims of Group II are classified under 435/6 and a search for the claims of Group II requires extensive search of the analyte binding, analyte detection, optical detection and signal and mass generating.

For the reasons given above, the requirement is still deemed proper and is therefore made FINAL.

Claims 51-82 are under prosecution. Claims 83-91 are withdrawn from consideration.

Species Election

2. Applicant's election with traverse of the species amorphous carbon is acknowledged. The species election requirement is withdrawn in view of Applicant's comments and reconsideration by the examiner.

Priority

3. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 120 as follows:

An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence of the specification or in an application data sheet (37 CFR 1.78(a)(2) and (a)(5)).

4. Applicant's claim for domestic priority under 35 U.S.C. 120 is acknowledged. However, the parent application 08/742,255 filed 31 October 1996 does not provide adequate support under 35 U.S.C. 112 for claims 53, 58-62, 64, 65, 68, 69, 74-78, 80 and 81 of this application. Specifically, the '255 application does not provide support for the instantly claimed "varying the sp^2 and sp^3 character of the diamond-like carbon" recited in claims 53 & 69; the diamond-like compounds recited in claims 58-60 & 74-76; the support material that is not compatible with high temperatures as recited in claims 61, 62, 77 & 78; the capture molecules recited in claim 68; and the hardness of the diamond-like carbon recited in claims 64, 65, 80 and 81. Because the '255 application does not teach the above limitations, the '255 application does not provide adequate support under 35 U.S.C. 112 for instant claims 53, 58-62, 64, 65, 68, 69, 74-78, 80 and 81. Therefore, the effective filing date for instant claims 53, 58-62, 64, 65, 68, 69, 74-78, 80 and 81 is the filing date of parent application 08/950,963 i.e. 15 October 1997.

Information Disclosure Statement

5. The references listed on the 1449 received 7 March 2001 have been reviewed and considered.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 51-82 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. Claims 51-66 are indefinite in Claim 51 for the recitation "wherein the attachment layer captures the analyte of interest" because it is unclear whether the claimed support comprises the analyte or whether the claimed support is intended to capture the analyte at some time in the future. It is suggested that Claim 51 be amended to clarify e.g. replace "captures" with "is modified for capture of" (page 34, lines 10-27).

b. Claim 53 is indefinite for the recitation "the degree of hydrophobicity" because the recitation lacks proper antecedent basis in Claim 51. It is suggested that Claim 53 be amended to provide proper antecedent basis e.g. replace "the" with "a".

c. Claim 53 is further indefinite for the recitation "the degree of hydrophobicity of the attachment layer is determined by varying the sp^2 and sp^3 character" because it is unclear whether the recitation is a method step of determining and/or varying and because it is unclear what structural limitations are being claimed. It is suggested that the claim be amended to clarify and to recite structural limitations of the support e.g. replace "is determined by varying" with "results from" (page 40, lines 6-20).

d. Claims 54 and 70 are indefinite for the recitation "is configured to function" because it is unclear whether the recitation is a method step for configuring. It is suggested that the claims be amended to clarify e.g. delete "configured to function as".

e. Claims 57 and 73 are indefinite for the recitation "is configured to provide" because it is unclear whether the recitation is a method step for configuring. It is suggested that the claims be amended to clarify e.g. replace "is configured to provide" with "provides".

f. Claims 67-82 are indefinite in Claim 67 for the recitation "wherein the attachment layer specifically captures said analyte" because it is unclear whether the claimed support comprises the analyte or whether the claimed support is intended to capture the analyte at some time in the future. It is suggested that Claim 67 be amended to clarify e.g. replace "specifically captures" with "comprises a capture molecule bound to said diamond-like carbon for specific capture of" and replace "a capture molecule bound to the diamond-like carbon" with "said capture molecule".

g. Claim 69 is indefinite for the recitation "the degree of hydrophobicity" because the recitation lacks proper antecedent basis in Claim 67. It is suggested that Claim 69 be amended to provide proper antecedent basis e.g. replace "the" with "a".

h. Claim 69 is further indefinite for the recitation "the degree of hydrophobicity of the attachment layer is determined by varying the sp^2 and sp^3 character" because it is unclear whether the recitation is a method step of determining and/or varying and because it is unclear what structural limitations are being claimed. It is suggested that the claim be amended to clarify and to recite structural limitations of the support e.g. replace "is determined by varying" with "results from" (page 40, lines 6-20).

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

Art Unit: 1634

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 51, 52, 58-63, 66-68, 74-79 and 82 are rejected under 35 U.S.C. 102(b) as being anticipated by Vadgama et al (WO 93/24828, published 9 December 1993).

Regarding Claim 51, Vadgama et al disclose a support comprising a surface on which an assay for an analyte of interest can be preformed comprising: an attachment layer comprising diamond-like carbon on the support surface and wherein the attachment layer captures the analyte of interest for detecting in the assay by binding the analyte directly to the diamond-like carbon (page, 2, line 32-page 3, line 2, page 8, lines 1-11 and Claim 10). The recitation "the attachment layer captures the analyte.....directly to the diamond-like carbon" describes the support in terms of how the support functions. The courts have stated that claims drawn to an apparatus must be distinguished from the prior art in terms of structure rather than function see *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA1959). "[A]pparatus claims cover what a device is, not what a device does." *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525,1528 (Fed. Cir. 1990) (see MPEP, 2114). Because Vadgama et al discloses the claimed structural components of the support i.e. an attachment layer comprising diamond-like carbon on the support, Vadgama et al discloses the claimed support.

Regarding Claim 52, Vadgama et al disclose the support wherein the attachment layer comprises a layer of diamond-like carbon of between about 50 Å to about 3000 Å (page 6, lines 2-9).

Regarding Claim 58, Vadgama et al disclose the support wherein the attachment layer comprises diamond-like carbon selected from the group consisting of synthetic diamond and amorphous carbon (page 5, lines 15-30).

Regarding Claim 59, Vadgama et al disclose the support wherein the diamond-like carbon comprises non-carbon material i.e. hydrogen (page 5, lines 19-21).

Art Unit: 1634

Regarding Claim 60, Vadgama et al disclose the support wherein the non-carbon material is hydrogen (page 5, lines 19-21).

Regarding Claims 61-63, Vadgama et al disclose the support wherein the support comprises a material not compatible with high temperatures i.e. polycarbonate (page 11, lines 30-33).

Regarding Claim 66, Vadgama et al disclose the support wherein the support is a biosensor (page 7, line 16-page 8, line 20 and Claim 11).

Regarding Claim 67, Vadgama et al disclose a support comprising a surface on which an assay for an analyte of interest can be preformed comprising: an attachment layer comprising diamond-like carbon on the support surface wherein the attachment layer comprises a layer of diamond-like carbon of between about 50 Å to about 3000 Å (page 6, lines 2-9) and wherein the attachment layer captures the analyte of interest for detecting in the assay by binding the analyte directly to the diamond-like carbon (page, 2, line 32-page 3, line 2, page 8, lines 1-11 and Claim 10). The recitation "the attachment layer captures the analyte.....directly to the diamond-like carbon" describes the support in terms of how the support functions. The courts have stated that claims drawn to an apparatus must be distinguished from the prior art in terms of structure rather than function see *In re Danly*, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA1959). "[A]pparatus claims cover what a device is, not what a device does." *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 909 F.2d 1464, 1469, 15 USPQ2d 1525,1528 (Fed. Cir. 1990) (see MPEP, 2114). Because Vadgama et al discloses the claimed structural components of the support i.e. an attachment layer comprising diamond-like carbon on the support, Vadgama et al discloses the claimed support.

Regarding Claim 68, Vadgama et al disclose the support wherein the capture molecule is an enzyme (page 8, lines 1-11 and Claim 11)

Art Unit: 1634

Regarding Claim 74, Vadgama et al disclose the support wherein the attachment layer comprises diamond-like carbon selected from the group consisting of synthetic diamond and amorphous carbon (page 5, lines 15-30).

Regarding Claim 75, Vadgama et al disclose the support wherein the diamond-like carbon comprises non-carbon material i.e. hydrogen (page 5, lines 19-21).

Regarding Claim 76, Vadgama et al disclose the support wherein the non-carbon material is hydrogen (page 5, lines 19-21).

Regarding Claims 77-79, Vadgama et al disclose the support wherein the support comprises a material not compatible with high temperatures i.e. polycarbonate (page 11, lines 30-33).

Regarding Claim 82, Vadgama et al disclose the support wherein the support is a biosensor (page 7, line 16-page 8, line 20 and Claim 11).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 53, 54, 69 and 70 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vadgama et al (WO 93/24828, published 9 December 1993) in view of Yu (U.S. Patent No. 5,273,788, issued 28 December 1993).

Regarding Claim 53, Vadgama et al teach a support comprising a surface on which an assay for an analyte of interest can be preformed comprising: an attachment layer comprising diamond-like carbon on the support surface and wherein the attachment layer captures the analyte of interest for detecting in the assay by binding the analyte directly to the diamond-like carbon (page, 2, line 32-page 3, line 2, page 8, lines 1-11 and Claim 10) but they are silent regarding the hydrophobicity and varying the sp^2 and sp^3 character of the diamond-like carbon. However, Yu teach variations in sp^2 and sp^3 characteristics which determine the hydrophobicity the diamond-like carbon films was well known in the art at the time the claimed invention was made as taught by Yu. Specifically, Yu teaches that the diamond-like film characteristics e.g. hydrophobicity are controlled by altering the sp^2 and sp^3 ratio as desired during formation of the film (Column 3, lines 15-35 and Column 3, line 54-Column 4, line 16). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the controlled film formation taught by Yu to thereby vary the hydrophobicity of the diamond-like carbon attachment later of the support of Vadgama et al. because one skilled in the art would have been motivated to vary the hydrophobicity of the attachment layer to optimize attachment of the capture molecule. For example, if the practitioner wished to attach a hydrophobic capture molecule to the support, the practitioner would vary the sp^2 and sp^3 ratio to optimize the hydrophobicity of the support to thereby facilitate attachment of the capture molecule as suggested by Yu (Column 3, line 54-Column 4, line 16).

Regarding Claim 54, Vadgama et al teach the support comprises diamond-like carbon (page 2, line 32-page 3, line) but they are silent regarding its function as an antireflective layer. However, it was known in the art at the time the claimed invention was made that diamond-like coatings are antireflective as taught by Yu (Column 1, lines 27-34). Therefore, the diamond-like coating of Vadgama et al is antireflective.

Regarding Claim 69, Vadgama et al teach a support comprising a surface on which an assay for an analyte of interest can be preformed comprising: an attachment layer comprising diamond-like carbon on the support surface wherein the attachment layer comprises a layer of diamond-like carbon of between about 50 Å to about 3000 Å (page 6, lines 2-9) and wherein the attachment layer captures the analyte of interest for detecting in the assay by binding the analyte directly to the diamond-like carbon (page 2, line 32-page 3, line 2, page 8, lines 1-11 and Claim 10) but they are silent regarding the hydrophobicity and varying the sp^2 and sp^3 character of the diamond-like carbon. However, Yu teach variations in sp^2 and sp^3 characteristics which determine the hydrophobicity the diamond-like carbon films was well known in the art at the time the claimed invention was made as taught by Yu. Specifically, Yu teaches that the diamond-like film characteristics e.g. hydrophobicity are controlled by altering the sp^2 and sp^3 ratio as desired during formation of the film (Column 3, lines 15-35 and Column 3, line 54-Column 4, line 16). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the controlled film formation as taught by Yu to thereby vary the hydrophobicity of the diamond-like carbon attachment later in the support of Vadgama et al. because one skilled in the art would have been motivated to vary the hydrophobicity of the attachment layer to optimize attachment of the capture molecule. For example, if the practitioner wished to attach a hydrophobic capture molecule to the support, the practitioner would vary the sp^2 and sp^3 ratio to optimize the hydrophobicity of the support to thereby facilitate attachment of the capture molecule as suggested by Yu (Column 3, line 54-Column 4, line 16).

Regarding Claim 70, Vadgama et al teach the support comprises diamond-like carbon (page 2, line 32-page 3, line) but they are silent regarding its function as an antireflective layer. However, it was known in the art at the time the claimed invention was made that diamond-like coatings are antireflective as taught by Yu (Column 1, lines 27-34). Therefore, the diamond-like coating of Vadgama et al is antireflective.

It is noted that the courts have stated that chemical compositions and its properties are inseparable. Therefore, the properties of the claimed diamond-like carbon are necessarily present in the diamond-like carbon of Vadgama et al.

"Products of identical chemical composition can not have mutually exclusive properties." A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990) see MPEP § 2112.01.

12. Claims 55-57 and 71-73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vadgama et al (WO 93/24828, published 9 December 1993) in view of Kobashi (U.S. Patent No. 5,777,372, issued 7 July 1998).

Regarding Claim 55-56, Vadgama et al teach a support comprising a surface on which an assay for an analyte of interest can be preformed comprising: an attachment layer comprising diamond-like carbon on the support surface and wherein the attachment layer captures the analyte of interest for detecting in the assay by binding the analyte directly to the diamond-like carbon (page, 2, line 32-page 3, line 2, page 8, lines 1-11 and Claim 10) but they are silent regarding an optically functional layer and/or a change in optical thickness upon binding of the analyte. Kobashi teaches a similar support comprising a surface on which an assay for an analyte of interest can be preformed comprising: an attachment layer comprising diamond-like carbon on the support surface and wherein the attachment layer captures the analyte of interest for detecting in the assay by binding the analyte directly to the diamond-like carbon (Column 4, lines 30-67) wherein the support further comprises an optically functional layer between the support and the attachment layer and wherein the support provides a

Art Unit: 1634

change in optical thickness upon binding the analyte (Column 10, lines 8-49). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the optically functional layer which provides a change in optical thickness upon analyte binding as taught by Kobashi to the substrate of Vadgama et al for the expected benefit of increasing the sensitivity of analyte detection as taught by Kobashi (Column 10, lines 50-55).

Regarding Claim 57, Vadgama et al do not teach the sample is configured to provide laminar flow through or across the support. Kobashi teaches the similar support comprising a surface on which an assay for an analyte of interest can be preformed comprising: an attachment layer comprising diamond-like carbon on the support surface and wherein the attachment layer captures the analyte of interest for detecting in the assay by binding the analyte directly to the diamond-like carbon (Column 4, lines 30-67) wherein the support is configured to provide laminar flow across the support (Fig. 7-15). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the support of Vadgama et al with the support configured to provide laminar flow of Kobashi for the expected benefits of sensitive and rapid results over time as taught by Kobashi (Column 4, lines 30-34).

Regarding Claim 71 and 72, Vadgama et al teach a support comprising a surface on which an assay for an analyte of interest can be preformed comprising: an attachment layer comprising diamond-like carbon on the support surface wherein the attachment layer comprises a layer of diamond-like carbon of between about 50 Å to about 3000 Å (page 6, lines 2-9) and wherein the attachment layer captures the analyte of interest for detecting in the assay by binding the analyte directly to the diamond-like carbon (page, 2, line 32-page 3, line 2, page 8, lines 1-11 and Claim 10) but they are silent regarding an optically functional layer and/or a change in optical thickness upon binding of the analyte. Kobashi teaches a similar support comprising a surface on which an assay for an analyte of interest can be preformed comprising: an attachment layer comprising diamond-like carbon on the support surface and

Art Unit: 1634

wherein the attachment layer captures the analyte of interest for detecting in the assay by binding the analyte directly to the diamond-like carbon (Column 4, lines 30-67) wherein the support further comprises an optically functional layer between the support and the attachment layer and wherein the support provides a change in optical thickness upon binding the analyte (Column 10, lines 8-49). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the optically functional layer which provides a change in optical thickness upon analyte binding as taught by Kobashi to the substrate of Vadgama et al for the expected benefit of increasing the sensitivity of analyte detection as taught by Kobashi (Column 10, lines 50-55).

Regarding Claim 73, Vadgama et al do not teach the sample is configured to provide laminar flow through or across the support. Kobashi teaches the similar support comprising a surface on which an assay for an analyte of interest can be performed comprising: an attachment layer comprising diamond-like carbon on the support surface and wherein the attachment layer captures the analyte of interest for detecting in the assay by binding the analyte directly to the diamond-like carbon (Column 4, lines 30-67) wherein the support is configured to provide laminar flow across the support (Fig. 7-15). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the support of Vadgama et al with the support configured to provide laminar flow of Kobashi for the expected benefits of sensitive and rapid results over time as taught by Kobashi (Column 4, lines 30-34).

13. Claims 64, 65, 80 and 81 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vadgama et al (WO 93/24828, published 9 December 1993) in view of Choi et al (U.S. Patent No. 5,883,769, filed 30 June 1997).

Art Unit: 1634

Regarding Claim 64, Vadgama et al teach a support comprising a surface on which an assay for an analyte of interest can be preformed comprising: an attachment layer comprising diamond-like carbon on the support surface and wherein the attachment layer captures the analyte of interest for detecting in the assay by binding the analyte directly to the diamond-like carbon (page, 2, line 32-page 3, line 2; page 8, lines 1-11 and Claim 10) but they are silent regarding the hardness of the diamond-like carbon. However, the properties of diamond-like carbon were well known in the art as taught by Choi et al. Specifically, Choi et al teach the hardness of diamond-like carbon is between about 15 to about 50 Gpa (Table 1, Column 3, lines 47-62). Therefore, the diamond-liked carbon of Vadgama et al has a hardness of between about 15 to about 50 Gpa as claimed.

Regarding Claim 65, Vadgama et al teach the support comprises diamond-like carbon (page, 2, line 32-page 3, line 2) but they are silent regarding the refractive index. However, the properties of diamond-like carbon were well known in the art at the time the claimed invention was made as taught by Choi et al. Specifically, Choi et al teach the refractive index of diamond-like carbon is about 1.5 to about 2.2 (Table 1, Column 3, lines 47-62). Therefore, the diamond-liked carbon of Vadgama et al has a refractive index of about 1.5 to about 2.2 as claimed.

Regarding Claim 80, Vadgama et al teach a support comprising a surface on which an assay for an analyte of interest can be preformed comprising: an attachment layer comprising diamond-like carbon on the support surface wherein the attachment layer comprises a layer of diamond-like carbon of between about 50 Å to about 3000 Å (page 6, lines 2-9) and wherein the attachment layer captures the analyte of interest for detecting in the assay by binding the analyte directly to the diamond-like carbon (page, 2, line 32-page 3, line 2, page 8, lines 1-11 and Claim 10) but they are silent regarding the hardness of the diamond-like carbon. However, the properties of diamond-like carbon were well known in the art as taught by Choi et al. Specifically, Choi et al teach the hardness of diamond-like carbon is between about 15 to

Art Unit: 1634

about 50 Gpa (Table 1, Column 3, lines 47-62). Therefore, the diamond-liked carbon of Vadgama et al has a hardness of between about 15 to about 50 Gpa as claimed.

Regarding Claim 81, Vadgama et al teach the support comprises diamond-like carbon (page, 2, line 32-page 3, line 2) but they are silent regarding the refractive index. However, the properties of diamond-like carbon were well known in the art at the time the claimed invention was made as taught by Choi et al. Specifically, Choi et al teach the refractive index of diamond-like carbon is about 1.5 to about 2.2 (Table 1, Column 3, lines 47-62). Therefore, the diamond-liked carbon of Vadgama et al has a refractive index of about 1.5 to about 2.2 as claimed.

It is noted that the courts have stated that chemical compositions and its properties are inseparable. Therefore, the properties of the claimed diamond-like carbon are necessarily present in the diamond-like carbon of Vadgama et al.

"Products of identical chemical composition can not have mutually exclusive properties." A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present. *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990) see MPEP § 2112.01.

Double Patenting

14. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Art Unit: 1634

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

15. Claims 51-82 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 7, 11, 23-34 and 38-50 of copending Application No. 08/950,963. Although the conflicting claims are not identical, they are not patentably distinct from each other because both sets of claims are drawn to a solid support comprising an attachment layer comprising diamond-like carbon and differ only in the scope of the claims. Specifically, the instant application broadly claims the genus solid support and the '963 claims the species solid support wherein some of the species further comprises an optically functional layer and/or provide for sample flow. However, the open claim language "comprising" recited in the instant claims encompasses the additional components of the '963 species. Additionally, instant claims 55, 57, 71 and 73 recite the '963 species limitations i.e. optically functional layer and/or provide for sample flow. Because the instantly claimed solid support is a genus of the '963 solid support species and because instant claims 55, 57, 71 and 73 recite the species limitations, the instant claims are obvious in view of the '963 solid support. The courts have stated that a genus is obvious in view of the teaching of a species see Slayter, 276 F.2d 408, 411, 125 USPQ 345, 347 (CCPA 1960); and In re Gosteli, 872 F.2d 1008, 10 USPQ2d 1614 (Fed. Cir. 1989).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

16. No claim is allowed.

Art Unit: 1634

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BJ Forman whose telephone number is (703) 306-5878. The examiner can normally be reached on 6:30 TO 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jones can be reached on (703) 308-1152. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-4242 for regular communications and (703) 308-8724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0196.



BJ Forman, Ph.D.
Patent Examiner
Art Unit: 1634
April 4, 2002